REMARKS

Applicant has amended claims 1, 5, 7, 8, 11, 12, 15, 20, 22, 23, 26, 27 to more particularly point out and distinctly claim the subject matter of the invention. Applicant has also added two new claims 28 and 29.

Applicant has submitted a new set of formal drawings, replacing FIGs 1-7, and amended the specification to conform with these replacement drawings. No new matter has been added. Attached is a marked-up version of the changes being made by the current amendment.

Applicant submits that all of the claims are now in condition for examination, which action is requested. Enclosed is a $36.00 check for excess claim fees. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the specification:

Paragraph beginning at page 5, line 25 has been amended as follows:

As shown in FIG. 2A, the network server 42 transmits the web page 70 to a user on client computer 14, 16, 18 to allow the user to send images 11 to the server 12. The user may add images to the web page by clicking on an add button 72. The web page 70 includes images 11a-11d that have been added to the web page 70 using the add button 72. The images 11a-11d depict overlapping segments of a view of a [lake] tree. The user may transmit each of the images 11a-11d by clicking on an upload button 74a-74d that corresponds to the image. The user directs the server 12 to create a panoramic image from the uploaded images by clicking on a create button 76, causing client computer 14, 16, 18 to transmit the images to the server 12 through the network 13. The input interface 44 of the network server 42 receives the images 11a-11d through the network interface 30 and conveys them to the image input interface 49, which in turn conveys the images 11a-11d to the image stitching software 48. The images stitching software 48 merges the images 11a-11d to form a panoramic image of the entire view of the scene, which it conveys to the output interface 46 of the network server 42.

Paragraph beginning at page 6 , line 22 has been amended as follows:

For example, as shown in FIGS. 4A and 4B, the positioning module 50 uses the two image positioner 60 to determine how much a first image 80a needs to be moved relative to a second image 80b so that a certain object depicted in both of the images 80a, 80b has its depiction in the second image 80[a]b on top of its depiction in the first image 80[b]a. In FIG. 4A, the image 80b must be moved 68 pixels to the right and 2 pixels upwards so that a branch 82 which is depicted in both image 80a, 80b has its depiction in the second image 80b on top of its depiction in the first image 80a. This ensures that the two images 80a, 80b are positioned so that the images 80a, 80b continue into each other as seamlessly as possible without altering the pixels of the images.

Paragraph beginning at page 9, line 11 has been amended as follows:

The dividing-line determiner 54 (FIG. 1) determines (212) an outline 85 (FIG. 4F) of a composite image formed by aligning the current image 80b and the reference image 80a (as previously described with reference to FIG. 4A). The dividing-line determiner 54 also determines a pair of points 87a, 87b where the outlines of the aligned images intersect, thereby defining (214) a line 89 that joins the points 87a, 87b and divides (216) the panoramic outline 85 into two sections 81, 83 (216). If the outlines of the aligned images intersect at more than two points, the dividing-line determiner 54 selects the two intersection points that are furthest apart from each other to define the dividing line 89. The dividing-line determiner 54 then determines (218) which one of the two sections 81, 83 has less of the current image 80b that is not overlapped by the reference image 80a and sets (220) that section [87a] 84 of the current image 80b to be invisible. In the example of FIG. 4F, the section 83 has none of the current image that is not overlapped by the first image 80a. Consequently, the portions of the image profile 85 contained within the section 84 are set invisible, leaving the hashed section [82] 81 of the image 80b visible.

Paragraph beginning at page 9, line 25 has been amended as follows:

The stitching software 48 checks (222) whether there are any more images between the reference image 80a and the current image 80b. If there are more images, the stitching software 48 sets (224) the reference image to be the next image after the current reference image and repeats the process of setting a section of the current image 80b invisible (208-220) as described above. Otherwise, if there are no more images, the blending mask determiner 56 (FIG. 1) determines (226) the pixels within the current image that will mask out pixels of earlier images. Only visible pixels [81] of the current image 80b mask out pixels of earlier images 80a. Consequently, the mask value of pixels contained within the region 81 is set to "1", while the mask property of pixels contained within the region 84 is set to "0".

Paragraph beginning at page 10, line 9 has been amended as follows:

If there are no more images after the current image, the image blender 58 overlaps (230) the images 80a-80f based on the masking value to create the panoramic image 94 (FIG. 4E).

The section [87a] 81 of the second image 80b with a mask value of 1 is first composited on the first image, thereby obstructing the part of the first image that is to the right of the dividing line 89. The portions of the third image 80c with a mask value of 90 are then composited on the composite image from the first 80a and second 80b image to create another image, and so on, until the composite image 94 is created. Thus, image stitching software merges images 80a-80f depicting sections of a scene to create a panoramic image of the whole scene.

In the claims:

Claims 1, 5, 7, 8, 11, 12, 15, 20, 22, 23, 26, 27 have been amended as follows:

1. (Amended) A method of merging images of segments of a view, comprising:

receiving a first image representing a first segment of the view and a second image representing a second segment of the view, the images being received from a remote location over a network;

determining the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator;

blending the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view; and

transmitting the panoramic image over the network[;

wherein the step of determining the position and the step of blending are performed without positioning information from a human operator].

5. (Amended) A method of merging a set of images, each image representing a corresponding [of segments] segment of a view[, comprising:

retrieving a set of images representing a view] , the set including a first image representing a first segment of the view, a second image representing a second segment of the view, and a third image representing a third segment of the view, where the third segment of the view overlaps both the first segment and the second segment of the view, the method comprising;

[determining a first position of the second segment of the view relative to the first

segment of the view;]

determining a [second] first relative position of the third segment relative to the first segment of the view by processing the content of the third image and the first image; [and a third]

determining a first overlap area of the first image and the third image based on the determined first relative position;

determining a second relative position of the third segment relative to the second segment of the view by processing the content of the third image and the second image;

determining a second overlap area of the second image and the third image based on the determined second relative position; and

[checking whether the first image overlaps the third image more than the second image overlaps the third image, based on the second position and the third position;]

if the first [image overlaps the third image more than the second image overlaps the third image] overlap area is greater than the second overlap area, [blending the] offsetting the position of the third image relative to the first image and the second image[set of images] based on the determined first relative position [and the second position];

otherwise, offsetting the position of the third image relative to the first image and the second image based on the determined second relative position.

7. (Amended) The method of claim 5 further comprising:

[prior to blending the set of images:]

determining which of the images is a central one and which are peripheral [ones of the set of] images [based on the first and second positions]; and

[correcting perspective distortion in a first peripheral one of the images relative to] using the central [one of the images] image as an initial reference image in correcting perspective distortion in peripheral images.

8. (Amended) The method of claim 7 further comprising:

[prior to correcting perspective distortion in the first peripheral one of the images:]

determining what pair-wise overlap areas exist between the central [one] image and each

of the peripheral [ones of the set of] images[, based on the first and second positions]; and

selecting [the first peripheral one of the images] as the first peripheral image to have perspective distortion corrected a peripheral image [to maximize the] having a maximum pair-wise overlap area [between] with the central image [and the first] relative to the other peripheral [one of the] images.

11. (Amended) The method of claim 5, [wherein] further comprising blending the [set of images] third image with the first and second image, wherein the blending [further] includes:

dividing the [second] third image into a first portion and a second portion, based on the first relative position; and

compositing the first portion of the [second] third image on the first image at the first position to produce a composite image[;], the compositing causing the first portion to mask out a part of the first image[;

blending the third image with the composite image to form the panoramic image].

12. (Amended) The method of claim 11 wherein blending the third image with the [composite image] first and second image further includes:

dividing the [third] second image into a third portion and a second portion, based on [the second] a relative position of the second segment of the view relative to the first segment of the view;

dividing the third portion into a fifth portion and a sixth portion, based on the [third] second relative position; and

compositing the fifth portion of the third image on the composite image based on the second relative position to form the panoramic image, the compositing of the fifth portion causing the fifth portion to mask out a part of the composite image.

15. (Amended) An article comprising a computer-readable medium on which are tangibly stored computer-executable instructions for merging images of segments of a view, the stored instructions being operable to cause a computer to:

receive a first image representing a first segment of the view and a second image representing a second segment of the view, the images being received from a remote location

over a network;

determine the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator;

blend the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view; and

transmit the panoramic image over the network.

20. (Amended) An article comprising a computer-readable medium which stores computer-executable instructions for merging a set of images, each image representing a corresponding [of segments] segment of a view[, the instructions being operable to cause a computer to:

retrieve a set of images representing a view], the set including a first image representing a first segment of the view, a second image representing a second segment of the view, and a third image representing a third segment of the view[;], where the third segment of the view overlaps both the first segment and the second segment of the view, the instructions being operable to cause a computer to:

[determine a first position of the second segment of the view relative to the first segment of the view;]

determine a [second] first relative position of the third segment relative to the first segment of the view by processing the content of the third image and the first image; [and a third]

determine a first overlap area of the first image and the third image based on the determined first relative position;

determine a second relative position of the third segment relative to the second segment of the view by processing the content of third image and the second image;

determine a second overlap area of the second image and third image based on the determined second relative position; and

[check whether the first image overlaps the third image more than the second image overlaps the third image, based on the second position and the third position;]

if the first [image overlaps the third image more than the second image overlaps the third image] overlap area is greater than the second overlap area, [blend] offset the [set of images] position of the third image relative to the first image and the second image based on the determined first relative position [and the second position];

otherwise, offset the third image relative to the first image and the second image based on the determined second relative position.

22. (Amended) The article of claim 21 wherein the stored instructions further comprise instructions operable to cause the computer to:

[prior to blending the set of images:]

determine which of the images is a central one and which are peripheral [ones of the set of] images [based on the first and second positions]; and

[correcting perspective distortion in a first peripheral one of the images relative to] use the central [one of the images] image as an initial reference image in correcting perspective distortion in peripheral images.

23. (Amended) The article of claim 21 wherein the stored instructions further comprise instructions operable to cause the computer to:

[prior to correcting perspective distortion in the first peripheral one of the images:]

[determining] determine what pair-wise overlap areas exist between the central [one] image and each of the peripheral [ones of the set of] images[, based on the first and second positions]; and

[selecting] select [the first peripheral one of the images] as the first peripheral image to be corrected for perspective distortion a peripheral image [to maximize the] having a maximum pair-wise overlap area [between] with the central image [and the first] relative to the other peripheral [one of the] images.

26. (Amended) The article of claim 21 wherein the stored instructions further comprise instructions operable to cause the computer to blend[ing] the [set of images] third image with the first and second image, wherein the blending [further] includes:

dividing the [second] third image into a first portion and a second portion, based on the

first position; and

compositing the first portion of the [second] third image on the first image at the first position to produce a composite image; the compositing causing the first portion to mask out a part of the first image[;

blending the third image with the composite image to form the panoramic image].

27. (Amended) The article of claim 27 wherein blending the third image with the [composite image] first and second image further includes:

dividing the [third] second image into a third portion and a second portion, based on [the second] a relative position of the second segment of the view relative to the first segment of the view;

dividing the third portion into a fifth portion and a sixth portion, based on the [third] second relative position; and

compositing the fifth portion of the third image on the composite image based on the second relative position to form the panoramic image, the compositing of the fifth portion causing the fifth portion to mask out a part of the composite image.

Claims 28 and 29 have been added.

28. The method of claim 1 further comprising:

prior to blending the set of images:

determining which of the images is a central one and which are images; and

using the central image as an initial reference image in correcting perspective distortion in peripheral images.

29. The method of claim 28 further comprising:

determining what pair-wise overlap areas exist between the central image and each of the peripheral images; and

selecting as the first peripheral image to have perspective distortion corrected a peripheral image having a maximum pair-wise overlap area with the central image relative to the other peripheral images.